NavMed 369

UNITED STATES NAVY

MEDICAL NEWS LETTER

Editor - Captain L. B. Marshall, MC, USN

Vol. 18 Friday, 21 September 1951 No. 6

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The Rapid-Rocking Bed: Its Effect on the Ventilation of Poliomyelitis Patients With Respiratory Paralysis

Recent improvements in the management of respiratory insufficiency in patients with acute poliomyelitis have considerably reduced mortality in this stage of the disease. As a result, increasing numbers of patients have required artificial respiration for long periods after the acute febrile stage of poliomyelitis has passed. Although tank-type "iron-lung" respirators are life-saving for acutely ill patients, their continued use over periods of many weeks or months is associated with certain disadvantages. These include fixation and fibrosis of the diaphragm, restriction of motion of the extremities and difficulty in inducing patients to rely on their own recovering ventilatory mechanisms. A device has been needed that would supply artificial respiration without these disadvantages.

Such a device is the rapid-rocking bed, which has been used during the past 2 years on the Adult Poliomyelitis Service of the New York Hospital. Introduced by Eve in 1932, rocking has since been shown to be an effective method of artificial respiration. The rocking beds rock through a smaller total arc than has been used in most of the studies on rocking as an emergency method of artificial respiration.

With a shallow tidal volume and rapid respiratory rate, most of an apparently large minute volume would be wasted in respiratory dead-space air exchange. Therefore, in evaluating the effect of rocking on the ventilation of poliomyelitis patients, the calculated effective alveolar minute ventilation was used instead of minute volume. This calculation approximated the amount of air actually available to the lungs for gas exchange.

Observations were made on 20 patients with spinal paralysis of the respiratory musculature. Fifteen patients were transferred from tank respirators to rapid-rocking beds as soon as their temperature reached normal and they could breathe unassisted for 5 minutes. The periods of time spent out of the respirator and on the rocking bed were increased each day. As indicated by tidal volume and vital-capacity measurements, the rapid-rocking bed brought about marked increases in ventilation over that of the resting state. Although rocking produced tidal volumes that were not so great as could be attained by tank respirators, adequate effective alveolar minute ventilations were produced in all convalescent patients.

The rapid-rocking bed was used in 5 patients in the acute stage of poliomyelitis with moderate respiratory insufficiency. Four had to be transferred to tank respirators in order to correct fatigue, carbon dioxide retention or anoxemia. The rapid-rocking bed provided barely adequate ventilation for the fifth patient in the acutely ill group.

Two rapid-rocking (Respir-aid) beds were used, equipped with footboards and gatch attachments for the knees and head. They were usually run at maximum rocking arc, 40 to 44 ^{o} total (20 to 22 ^{o} in each direction from the horizontal). The rate of rocking could be adjusted from 6 to 28 complete cycles per

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minute; rates of from 16 to 24 cycles per minute were generally employed, according to the amount of ventilation produced.

Patients were placed in the supine position on the bed with the knee gatch usually elevated 4 to 5 inches and the head gatch raised no more than 2 to 3 inches. Greater elevations of the head or knees restricted diaphragmatic motion and were therefore contraindicated. Placing patients' feet against the footboard and inserting pillows against hips and shoulders prevented sliding on the bed while rocking.

The tank-type respirators employed were standard Drinker and Emerson types, run at pressures and rates indicated. Tidal volume and vital capacity were measured, as were venous-plasma carbon-dioxide combining power and arterial-blood oxygen saturation. Effective alveolar minute ventilation was calculated.

During the convalescent stage of poliomyelitis, gradually increasing periods of time on the rapid-rocking bed proved to be safe and valuable for patients with respiratory paralysis. The rocking bed aided rehabilitation of respiratory function by providing a bridge between the total ventilatory support of the respirator and the independent unsupported breathing state that is the goal of convalescent treatment for every respirator patient.

The means by which rocking substantially increases ventilation over resting levels is the alternate shifting by gravity of the abdominal viscera; this movement forces the diaphragm up and down in piston-like fashion. For poliomyelitis patients, a total arc of 40° was the maximum that could be comfortably tolerated when the bed was used for periods of several hours.

Advantages of the Rocking Bed. Since it provided excellent ventilation for all convalescent patients, the rocking bed allowed patients early freedom from tank respirators, which they would not otherwise have attained. As patients improved, transient periods on the rocking bed provided all the artificial respiration necessary and considerably shortened the length of time that a respirator was needed. By the removal of patients to rocking beds from the confined space of tank respirators, nursing care, physiotherapy and other therapeutic measures were accomplished more easily. Early full passive joint motion was possible, and contractures of such joints as the shoulders did not occur, as had formerly been the case in respirator patients. Fibrosis and fixation of the diaphragm was prevented, as rocking produced artificial respiration largely by moving the diaphragm up and down. By these various measures it was possible to keep patients' paralyzed musculature in optimal condition in preparation for the possible return of neurologic control of muscle function.

The psychologic aid to every patient was tremendous. Not only did the rocking bed give patients their first feeling of improvement by freeing them from respirators, but it also enabled several patients to conquer their dependence on the respirator and oriented them to greater use of their own muscles of breathing.

Limitations of the Rocking Bed. During the acute stage of poliomyelitis, fever, infection and anxiety increased patients' oxygen consumption and carbon-dioxide production, adding to their ventilatory requirements. The rocking bed, since it brings about less ventilation than tank respirators, may be unable to meet the increased ventilatory needs during this phase. Plasma carbon-dioxide combining powers that continued to rise after patients were treated with the rocking bed were evidence of underventilation. In addition, the first experience of acutely ill patients on the bed lasted for many hours. As a result they had no opportunity to adjust gradually to the motion, were unable to sleep and sometimes became nauseated while rocking.

For these reasons, during the acute stage of poliomyelitis, patients with respiratory insufficiency due to spinal paralysis were better managed in tank respirators. It was usually thought undesirable to transfer patients from respirator to rocking bed during the acute stage, as this would increase anxiety and might precipitate sudden panic and a respiratory emergency. Both ventilation studies and clinical experience indicated the wisdom of reserving the rapid-rocking bed for use with convalescent patients.

The repeated determination of tidal volume and vital capacity by spirometer was of invaluable assistance in the management of all patients in the acute and convalescent stages of poliomyelitis. Spirometry, regularly performed on even the most extremely ill patients since 1949, eliminated inaccurate clinical estimations of ventilation and caused no fatigue to the patients. These measurements gave an early and accurate indication of the need for a respirator (adult vital capacity falling below 800 to 1000 cc.) and revealed hypoventilation or hyperventilation in patients actually in respirators. From these measurements respirator pressures and rates could be quickly adjusted to produce physiologically effective minute ventilation. During convalescence repeated tests graphically demonstrated ventilatory improvement and provided an objective basis for determining how soon the respirator could be omitted. When their vital capacity at rest increased to 500 to 600 cc., adult convalescent patients could remain an entire day out of a respirator, needing only intermittent periods on the rocking bed. When their vital capacity at rest rose above 800 cc., further artificial respiration was rarely needed.

Repeated determination of the venous-plasma carbon-dioxide combining power gave important information in the evaluation of patients with respiratory insufficiency. Some of the acutely ill patients who were treated with the rocking bed eliminated carbon dioxide inadequately from the lungs, as demonstrated by rising carbon-dioxide combining powers, even though nasal oxygen administration prevented anoxemia. Carbon-dioxide retention with an associated respiratory acidosis may result in confusion, somnolence, hypertension and vascular collapse. These dangers emphasize the need for enough ventilation to eliminate carbon dioxide as well as to prevent anoxemia.

Serial checks of the carbon-dioxide combining power and spirometric recordings will usually indicate whether ventilation is sufficient to expel carbon dioxide fully. When these measurements are not available the reversible narcotic

effects of carbon dioxide may be erroneously attributed to "polio-encephalitis," the need for greater ventilation going unrecognized. (New England J. Med., 16 August 1951, F. Plum & G. D. Whedon)

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Gastric Surgery in the Aged

For many years surgeons would attempt gastric operations upon the aged only with great reluctance because of the almost prohibitive mortality rate. With the advent of early ambulation after operation as a means of restoring the deranged physiology to normal in as short a time as possible, it was soon noted that aged patients were particularly benefited. Hypostatic pneumonia was very common following major surgical procedures prior to the advent of early ambulation, but has been reduced to a very low level in recent years. The improvements in surgical technic and increased knowledge of water and electrolyte metabolism, with the liberal use of the antibiotics, has made it possible to perform the most extensive operations in the aged without prohibitively increasing the mortality rate.

Between the years of 1943 through 1947, 418 gastrectomies were performed at the Grace Hospital (Detroit, Michigan), with an overall mortality rate of 10 percent. These operations were performed by all surgeons having major surgical privileges.

During this same period of time, 74 of the 418 patients were over the age of 60. The oldest patient having a gastrectomy was 86 years old. It is thus evident that 17.7 percent of all patients subjected to gastric surgery were over the age of 60.

The mortality rate for this group of 74 patients over the age of 60 was 16.2 percent. Comparing this figure with that for gastric surgery at all ages one notes that although the mortality rate has increased by 6.2 percent, this does not constitute a prohibitive increase. The fact that a patient was well over 60 or even 70 years old need no longer be a deterrent to gastric surgery when indicated. Such surgery in this age group, just as in the younger age groups, was undertaken only after the patient had been well worked up and the indications for surgical intervention unmistakable. Gastric carcinoma and elective surgery for duodenal ulcerative lesions were the most important indications for surgery in this age group. In general, the indications for surgery in this age group were the same as in the younger age groups with the exception of the treatment of gastroduodenal hemorrhage. In the younger age groups, 1 massive hemorrhage was not considered an indication for gastrectomy. In the age group above 60, however, patients who had 1 massive gastroduodenal hemorrhage were considered candidates for gastrectomy, the difference in indications being dependent upon the sclerosis of the main arteries of the stomach found after the age of 60. Such sclerotic vessels are believed more likely to exsanguinate the patient in the event of erosion. The results of surgery for this

indication were uniformly good.

In reviewing the list of patients in this group of 74, it was found that 58 patients (79 percent) were between the ages of 60 to 70. In the 70 to 80 year old group, 18 patients were operated upon (18 percent). Two of the patients were between the ages of 80 to 90. Although the majority of the patients operated upon were below the age of 70 (79 percent), 18 percent of the patients were 70 years or older. In this latter group, in former years only surgery of the most conservative type would have been undertaken.

The indications for surgery and the pathological findings at operation showed some difference between this older group of patients as compared with the group of patients under the age of 60. Forty-two patients (56 percent) were operated upon for duodenal ulcerations. Most of these patients had a history of one or more massive hemorrhages. Eleven patients were operated upon for gastric ulcer. The combined percentage of patients operated upon for gastric and duodenal ulcerative lesions was 6 percent lower than in the younger age group. Fourteen (18 percent) of the patients were operated upon for carcinoma of the stomach. This figure is higher than the 5 percent noted in the younger age group. These results are not surprising because of the increase in life span in which malignant lesions are commonly found. One patient was operated upon for a marginal ulcer. Three patients were operated upon for chronic hypertrophic gastritis. Two patients had gastric polyps and 1 patient presented a herniation of the stomach through a diaphragmatic hernia.

There were 12 deaths in this series of 74 patients. In reviewing the cause of death, it was found that peritonitis was responsible for 8 of the 12 deaths. The second most common cause of death was postoperative hemorrhage. In only 1 case was cardiac failure a cause of death. Both peritonitis and postoperative hemorrhage are causes of death most likely due to faulty surgical technic and should be attributed to poor surgery rather than the age of the patient operated upon.

Nine of the patients in this group of 12 deaths were found to be in the 60 to 70 year old group, an incidence of 75 percent. Three (25 percent) of the patients were in the 70 to 80 year old group. The number of patients that died in each age group were in the same ratio as the number of patients in each group in the entire series of patients operated upon. From this point of view, no increase in mortality rate beyond the age of 70 is noted. (Am. J. Digest. Dis., August 1951, R. P. Reynolds & M. O. Cantor)

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Incontinentia Pigmenti

Incontinentia pigmenti is a peculiar skin disease, probably developmental in origin, characterized by an extremely striking and bizarre arrangement of pigmented macules in polyangular flecks, whorls, spidery forms, lines and patches. These chocolate-brown designs do not follow lines of cleavage or

distributions of nerves, nor do they respect the limitations of the midline. Areas of alopecia in the scalp appear frequently, and many other ectodermal and mesodermal defects occur. Among these are developmental defects of the integument and its accessories, ocular and central-nervous-system defects, osseous deformities, and perhaps other mesodermal anomalies.

The pigmentary anomaly is frequently heralded by inflammatory lesions, particularly bullae, in lines and patches. The bullae disappear and recur for weeks or months and then finally give way, either to the pigmented macules directly or to an intermediate temporary stage of linear verrucous lesions which gradually fade out, leaving the typical end picture of incontinentia pigmenti. The bullous phase is so characteristic that a prediction of incontinentia pigmenti can be made at that time.

Since 1925, 30 cases have been presented in the literature and before dermatological meetings, and at least 2 other patients have been referred to, although they apparently were not examined by the reporting physician. During the past 6 years, 5 patients with incontinentia pigmenti were studied at the University Hospitals, (Iowa), and in 2 of these the full development of the disease was observed.

Although incontinentia pigmenti has been classed as a systematized nevus, the peculiar phases in its development, its histopathologic picture and its total disregard for the midline and for cleavage planes make this view rather hard to support. It would seem that the disorder is better labeled a developmental anomaly, at least for the present.

The hereditary nature of the disease is not well established, although Cockayne classed it as a dominant inborn anomaly. There are authenticated cases of familial and hereditary transmission of the disease, and other cases show inheritance of other developmental anomalies in association with incontinentia pigmenti; at least the disorder tends to occur in families with defective germ plasm.

There is a strong sex predominance in incontinentia pigmenti; of 37 cases, including the 5 here reported, 33 were in females and 4 in males. Too few cases exist for any estimate of racial incidence; the anomaly has been reported in Negroes and in Chinese and Japanese.

Incontinentia pigmenti begins early in life but apparently can appear at any time up to the end of the second year. About half the cases showed an inflammatory prodrome, and about 30 percent, vesiculation. Similarly, warty lesions were observed in one third of the cases. Many of the case reports are incomplete in regard to these prodromal features, perhaps because they were not looked for. It is interesting to note that a history of inflammation or of blisters was obtained most frequently in those patients seen at an early age, possibly because of the frailty of human memory.

Associated developmental defects in the 37 cases include the following: delayed or imperfect dentition, 11 cases; osseous deformities, 8; alopecia, 7; spastic paralysis, 7; strabismus, 5; epilepsy, 4; microcephaly, 4; mental deficiency, 4; retarded growth and development, 3; corneal opacity, 3; dystrophia unguium, 3; cataracts, 2; optic atrophy, 2; blue scleras, 2; nystagmus, 2; follicular atrophoderma, 2; and single instances of retrobulbar glioma, congenital

heart disease, urachal cyst, absence of retinal pigment, supernumerary ears and nevoid patch of the retina. In 5 of the cases there were no developmental defects other than the pigmentary disease, and for 10 other cases the reports are equivocal or incomplete.

The disease showed a familial or hereditary tendency in 4 instances, involving 9 cases, and in 7 further instances other developmental defects were present in siblings or parents. The latter included dental anomalies, follicular atrophoderma, osseous deformities, mental deficiency, strabismus, paralyses, blindness, blue scleras, nail changes and corneal opacities.

Many of the cases, including those observed by the author, showed some tendency to atrophy in certain of the pigmented areas, particularly over a period of years. Curth feels that this tendency represents a part of the syndrome of follicular atrophoderma, pseudopelade and chondrodystrophia calcificans congenita on which she has reported. In Carney's cases the atrophy has appeared to be in areas presently or previously involved with the pigmentary disorder, the areas of alopecia have for the most part been pigmented and there has been no evidence of chondrodystrophia calcificans congenita. Closer examination, better description and thorough x-ray studies will be necessary to resolve this question. Defects in development occurring in this group of disorders appear to be widely diversified and defy delineation into fixed categories. (Arch. Dermat. & Syph., August 1951, R. G. Carney)

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The Use of a Cation Exchange Resin in the Management of the Fluid Retentions of Normal and Toxemic Pregnancies: Preliminary Report

The earliest sign of an impending toxemia of pregnancy is an excessive gain in weight due to fluid retention. This is produced by a retention of electrolytes, principally sodium, and water. Apparently there is an increased tubular reabsorption of sodium in the kidney, which creates a positive sodium balance. This retained ion is stored in the extra vascular space with its bound water. The exact mechanism which initiates this pathological condition is unknown, but it has been shown conclusively that if the sodium intake is restricted, the syndrome of fluid retention can be prevented or reversed. But low sodium diets are rather unpalatable, and it is exceedingly difficult to convince asymptomatic young pregnant women that it is necessary for them to restrict their dietary sodium intake. Because they rarely heed the physician's advice, hospitalization is frequently necessary to protect them and to instruct them in the preparation and use of a low sodium diet.

Recently organic chemical agents, the cation exchange resins, used commercially for years, have been introduced into medicine. These agents permit the patient to ingest sufficient sodium to satisfy the need for a palatable diet, yet prohibit its absorption in the gastrointestinal tract (See Medical News Letter, Vol. 18, No. 3). The resin used in this study, Resodec, is the potassium

and ammonium form of a cross-linked, polyacrylic (polycarboxylic) cation exchanger. Because potassium is the only element, other than sodium, which is removed from the gastrointestinal tract in significant amounts by the resin, this ion is added in sufficient quantity to compensate for the loss. The ammonium ion is added in order to provide maximum palatability and also to act as a mild diuretic.

In humans, preliminary clinical work indicates that the resin does not interfere with the utilization of vitamins. Reportedly, acidosis is not met except in patients with severe renal damage. The binding capacity of this resin is approximately 4 1/2 to 5 mEq. per Gm. The usual daily dose of 45 Gm. supplies about 2 1/2 Gm. of ammonia which is equivalent to the administration of 8 Gm. of ammonium chloride.

Eleven patients with fluid retention of pregnancy were treated with a cation exchange resin (the resin was not used in the treatment of pre-eclampsia or eclampsia). From this investigation it appears that this resin permits the daily ingestion of 2 to 3 Gm. of sodium, with the simultaneous mobilization of the excessive fluid which was retained in the tissues. No fluid mobilization was achieved with the resin when the patient's ingestion of sodium was unlimited, nor was fluid mobilization seen when the patient was sustained on the 2 Gm. sodium diet without the resin. Therefore, it appears that Resodec is a valuable addition to the present regimen and may prove to be of greatest value in the management of the fluid retentions of pregnancy in outpatients who refuse to adhere, or find it difficult to adhere, to low sodium diets. (Am. J. Med. Sci., August 1951, W. R. Penman)

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Polycystic Renal Disease With Particular Reference to Author's Surgical Procedure

This study of polycystic renal disease was undertaken primarily to gather data regarding results obtained in 18 cases by an operative procedure described by the author 5 years ago, and to compare the results obtained in 18 other patients to whom conservative treatment was given.

A probable diagnosis of polycystic renal disease depended on: history, most important; pyelographic picture (bilateral); specific gravity of the urine, persistently low; changes in the blood chemistry and excretory functional tests.

In the author's procedure, the kidney is exposed and delivered. All the large cysts are evacuated and many of the smaller similarly treated. Parts of the walls are excised. The kidney is then split for its whole length down to the calyces and more cysts are exposed and drained. Efforts are made not to open into the calyces or pelvis, otherwise urine will drain for several weeks, not a serious complication. The open halves of the kidney are then sutured with No. 2 or 3 chromic catgut to the edges of the skin wound, suspending the kidney and leaving it exposed. The sutures are placed through the cortex on each side and

then through the muscles, fascia and skin. A vaseline gauze dressing is applied and the wound kept open as long as possible. A scar will form over the kidney which is directly under the skin. Subsequent punctures are made when necessary through this scar to the kidney without danger of going into the peritoneum or injuring any important structure.

Analysis of the cases emphasizes that this is a devastating disease. At best there is no hope for a cure up to the present time, but every effort must be made to relieve by making an early diagnosis.

Pain and discomfort in most cases are troublesome symptoms and should be relieved if possible without subjecting the patient to any unnecessary procedures. Other subjective and objective symptoms must be dealt with in the best possible manner.

Of the 11 known cases of death in the nonoperative group, the longest period in which a patient remained alive was 5 years, with an average of 1 1/6 years. In this same group, of the 5 who are living, the longest period to date is 7 years with an average of 4 4/5 years. It might be argued that had any of the 11 who died been subjected to surgery before the patients became moribund, the results would have been different. Certainly they could not have been any worse. By comparing these cases with those with the same condition who were subjected to surgery, one would say that the results were somewhat better among the operative cases. One patient lived as long as 13 1/2 years and the entire group averaged 4 1/12 years of life, an average of almost 4 times as long as the nonoperative group, to which is added the comfort they had for a time following the operation. Of the 8 living, one lived as long as 13 years with an average of all of 8 1/2 years, practically twice as long as those who lived without surgical interference. Again added to this is the comfort they are having for a while after the operation. This average span of life will certainly be increased, because one of these patients has recently been operated upon and is doing nicely.

Three of the patients who died very shortly after the operation never should have been operated upon because of their poor condition. The other 7 were so far advanced that they probably would be excluded for operation in the next series of cases. Of the 5 who are living without surgical procedure, only 2 have been able to occupy their time partly. Of the 8 living after the surgical procedure, all but 1 are engaged in their previous occupations. (J. Urol., August 1951, A. E. Goldstein)

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Stellate Ganglion Block in Treatment of Acute Subdeltoid Bursitis

Acute subdeltoid or subacromial bursitis, with or without calcareous tendinitis or peritendinitis, is a painful and incapacitating disorder of rather frequent incidence in the 3d and 4th decades of life. It is more common in the male, in the ratio of 2:1. The exact cause cannot always be well established, although minor unrecognized trauma is believed to be a prime factor. The in-

tense pain, discomfort and limited shoulder motion result from local swelling and exudation following prolonged and intense vasoconstriction, dilation and stasis of the venocapillary bed, with secondary diapedesis of cellular and plasma elements and persistent arteriolar constriction. Shoulder joint motion is limited by impingement of the swollen, inflamed, sensitive soft tissues of the subacromial bursa (and perhaps the tendinous shoulder cuff) against the acromion process as the arm is raised, rotated or lowered.

Stellate ganglion blocks serve to interrupt this severe cycle of vasospasm, exudation and pain by producing intense localized vasodilation and subsequent absorption of the painful exudate. As the effect of the block gradually diminishes, the vasoconstriction partially recurs, absorption is interrupted, and probably more exudation follows, resulting in further pain and discomfort. With each subsequent block there is progressively less tendency to return of the vasoconstriction and vasodilatory effect is the more sustained. A constant confirmatory observation was that the patient with the warmest reactions in the shoulder had the maximum relief of symptoms.

The beneficial results observed with other forms of therapy, such as roentgen rays, diathermy, infra-red rays, procaine injection and needling, are undoubtedly due to the production of local hyperemia and consequent similar absorption of exudate and edema. However, block of the stellate ganglion produces much more prompt and more intensive hyperemia than does any one of these agents; this may well explain the more dramatic and sustained relief obtained, with resultant return to normal function within an average period of less than 5 days, as contrasted to periods of 2 to 6 weeks with other forms of therapy.

The technic employed in most of this series was the anterolateral approach of Murphey, which yielded successful blocks in every case with a minimum of difficulty and risk. The true anterior technic of De Sousa Pereira was successfully used, but proved less satisfactory. The older supraclavicular methods are much more dangerous and should not be employed. The posterior technic, somewhat similar to that employed for the lumbar parasympathetic block, is also effective and fairly safe. The results are identical once a successful block has been established, so that the actual technic employed is a matter of personal preference and familiarity. However, maximum vasomotor effects are produced if the middle and intermediate cervical ganglia are included in the stellate ganglion block.

There were no serious complications in this series. The only untoward effects noted were a procaine reaction, transitory cervical and scapular pain from piercing of the prevertebral fascia, and occasional numbness of the arm from partial block of the brachial plexus. Pneumothorax, hydrothorax, air embolism, fatal subarachnoid injection, phrenic nerve paralysis with limited diaphragmatic motion and cardiorespiratory paralysis from a vagal inhibitory reflex may occur unless proper precautions are constantly exercised. These include careful direction of the needle and deep inspiration to observe for sucking effect, and a 1 cc. trial injection, with a waiting period of 30 seconds prior to the complete injection. The injection should never be lightly regarded or performed in the clinic or office unless proper resuscitation equipment is

available.

The results of stellate ganglion block are most striking in cases of acute severe involvement of recent onset; immediate, dramatic relief of pain is obtained, and there is an increase in active and passive shoulder motion. Although a mild relapse may occur when the effect of the block has disappeared, further improvement is secured by additional blocks at intervals of 1 or 2 days until normal function is completely restored. In the 2 "mild" cases, 1 or 2 blocks were required to restore completely normal function within 72 hours; in 15 cases in the "moderate" group an average of 2 blocks produced excellent results in 40 percent within 2 hours and in 86.6 percent within 1 week, and in 19 cases in the "severe" group an average of 3 blocks restored normal function in 89.4 percent within 1 week. In the latter group 6 patients, or 31.5 percent, had a normally functioning arm 72 hours after beginning therapy for a severely disabling and painful shoulder.

Thus, there were excellent results in 32 cases, or 88.9 percent; in 4 cases, or 11.1 percent of those in which the patients were not completely well within 1 week, a few physical therapy treatments given after return to work cleared the residual symptoms. The average periods of disability were 1 1/2 days in the "mild" cases; 3 2/10 days in the "moderate" group, and 5 5/100 days in the "severe."

Calcareous deposits were detectable by roentgen examination in 29 of 34 cases studied. After an interval of 6 to 18 months there was marked or complete absorption of calcium in 16, or 88.8 percent, of 18 in which the patients were available for follow-up roentgen studies.

A total of 25 patients were followed for 1 to 4 years; there were only 2 mild recurrences, 7 and 12 months later, but both promptly cleared with one physical therapy treatment.

The use of an oral vasodilator drug was tried in 2 cases, but the results were not encouraging. Perhaps intra-arterial injection would be more effective, but stellate block is a simpler procedure. A supraclavicular sensory nerve block to interrupt the afferent half of the reflex arc is reported to be of value, but it has not been attempted by the author.

As experience was gained it was observed that occasionally a fourth block would promptly clear up any mild residual symptoms, so that it was unnecessary to resort to 1 or 2 weeks of physical therapy. After the first block, with subsequent relief of pain, patients are generally less apprehensive and more receptive to further injections. The mild preoperative sedative given prior to the first block was usually not necessary for subsequent injections. (J. Internat. Coll. Surgeons., August 1951, E. J. Gordon)

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Q Fever in California

Q Fever was originally described by Derrick in Queensland, Australia, where it was first observed as an acute febrile illness among abattoir workers. Since 1945, the disease has been reported from many parts of the world and

from a number of widely separated localities of the United States. At present the disease appears to be established endemically in California, where in the past 3 years more than 700 cases have been recognized and confirmed in the laboratory. In certain parts of the state this disease has become an important addition to the differential diagnosis of acute febrile illnesses.

The disease is caused by a Rickettsia, previously known as Rickettsia burneti or Rickettsia diaporica, but now designated as Coxiella burnetii (Derrick). The genus Coxiella has been chosen because this organism differs from other members of the rickettsial group in several important respects; e.g., the organism is filtrable, produces no soluble antigen and does not give rise to the Proteus X agglutinins (Weil-Felix reaction).

In California natural infection with C. burnetti is known to occur in certain species of domestic livestock, viz., cattle, sheep and goats. There is evidence that these species are involved in the epidemiology of the human disease. The epidemiologic pattern of the disease, however, has not as yet been clearly outlined.

The following discussion is concerned with clinical observations on 180 persons in Northern California who were ill with Q fever.

Each case in this series satisfied one or more of the following diagnostic criteria: demonstration of the causal Rickettsia in the blood during the course of acute illness; demonstration of a fourfold or greater rise in complement-fixing or agglutinating antibody titer during illness and convalescence; demonstration of a significantly high complement-fixing or agglutinating titer without a subsequent rise, together with a history of recent (within 2 months) illness clinically compatible with the diagnosis of Q fever. Serum antibody titers of 1:32 were considered as "significant."

TABLE 1.—*Symptoms Noted in 180 Patients with Q Fever, Northern California, 1948-1949*

Symptom	Number of Patients	Per Cent of Patients	Symptom	Number of Patients	Per Cent of Patients
Onset			Respiratory		
Sudden	130	72	Cough	43	24
Gradual	50	28	Chest pain	18	10
Constitutional			Sore throat	9	5
Fever	180	100	Coryza	7	4
Chills	133	74	Gastrointestinal		
Chilliness	56	31	Anorexia	77	43
Sweating	67	37	Nausea	40	22
Malaise	180	100	Vomiting	23	13
General weakness	155	86	Diarrhea	9	5
Neuromuscular					
Headache	117	65			
Muscle pain	85	47			
Joint pain	20	11			
Retrobulbar pain	23	13			

TABLE 2.—*Physical Findings in 180 Patients with Q Fever, Northern California, 1948-1949*

Physical Findings	Number of Patients	Per Cent of Patients	Physical Findings	Number of Patients	Per Cent of Patients
Respiratory			Neurological		
Rales	38	21	Nuchal stiffness	9	5
Altered breath sounds	4	2	Apathy	4	2
Dulness	5	3	Confusion	9	5
"Positive"* roentgenograms (65 patients)	(22)	(34)	Altered reflexes	2	1
Abdominal			Cardiac		
Hepatomegaly	20	11	Irregular rhythm	4	2
Hepatic tenderness	13	7	Murmur	1	<1
Splenomegaly	7	4	Cutaneous		
Splenic tenderness	4	2	Rash	7	4
General tenderness	5	3	Jaundice	9	5

* Includes all abnormalities observed in chest roentgenograms.

In tables 1 and 2 on page 15 are listed the symptoms and physical findings in the 180 patients in this series with their frequency of occurrence. Percentages are stated to the nearest whole number.

The prognosis for life is excellent. There were no deaths attributable to Q fever in this series of 180 persons; one person died of a brain tumor 2 months following his illness with Q fever.

The occasional occurrence of thrombophlebitis suggests the potential hazard of pulmonary embolism, however, and the rather intense hepatic damage occasionally evident suggests a danger of superimposition of new and possibly serious damage on preexisting damage from other causes.

Disability following illness may be serious, and in older persons complete return to the previous state of well-being may be extremely slow. In certain instances protracted disability and recurrent febrile episodes, the etiological basis of which cannot be ascertained, have followed the initial attack. This suggests that the occurrence of chronic Q fever is a distinct possibility.

Clinical or roentgenographic evidence of pulmonary involvement is not essential for a diagnosis of Q fever. On the other hand, hepatic involvement is not uncommon in this disease, and evidence of liver damage should not be considered as inconsistent with a diagnosis of Q fever. (A. M. A. Arch. Int. Med., August 1951, W. H. Clark, E. H. Lennette, O. C. Railsback & M. S. Romer)

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Evaluation of the Surgery of Congenital Cataracts

In the textbooks of ophthalmic surgery very little space has been devoted to a consideration of congenital cataracts. In recent years, however, and especially since the recognition of the rubella cataract, new interest in the subject has developed. Care of congenital cataracts is clearly a matter of first importance, to the community as well as to the patient; and this fact suggested that an attempt to evaluate the various surgical procedures currently in practice might serve a useful purpose.

Congenital cataract is usually not discovered until the child is several weeks or months old, and partial cataract which leaves some vision intact may be overlooked for an even longer time. The very narrow pupils of newborn babies, their habit of sleeping a good deal, and their inability to fix very often obscure the fact that they do not see.

Certain forms of congenital cataract show a hereditary tendency. Marner reported on a family in which the occurrence of cataract could be traced back to 1780, through 8 generations. The cataract descent was dominant, as apparently is usually the case. As often happens, the type did not run true throughout the family; the zonular cataract was the commonest, but central, anterior polar, stellate and combined forms were also observed.

Falls and other observers have shown that in approximately 50 percent of all cases of congenital cataract other ocular defects are present; these include amblyopia, nystagmus, aniridia, choroidal and retinal changes, and strabismus. Many babies with cataract show other, general congenital anomalies. Mental retardation occurs in a fairly high percentage and, according to Krause, may not make its appearance until the child is 4 years of age or more. It has been held that the mental retardation in cases of congenital cataract is due to the lack of vision, and there is no doubt that in some instances restoration of vision has apparently had a very beneficial effect on the child's mentality. Other children with congenital cataract, however, for whom nothing could be done to restore vision have shown no evidence of mental deficiency.

It has long been recognized that the prognosis of surgical intervention in cases of congenital cataract must be guarded. Moreover, in view of the inevitable operative risks, e.g., of anesthetic accident, postoperative infection and surgical complication, congenital cataract surgery should be undertaken only after the most careful consideration. The type of operation to be performed must then be decided upon, and to this end a thorough knowledge of the various types of cataract encountered is of first importance.

It is important to remember that the surgical prognosis in congenital cataract is not as good as it is in senile cataract. In at least 50 percent of cases other congenital ocular anomalies may complicate the surgical procedure. In only approximately 50 percent is postoperative vision of 20/200 or better achieved, so that if a child has a vision of 20/50 the cataract should probably be left alone.

If surgical intervention is indicated, linear extraction performed at one sitting is the operation of choice in the average soft cataract. If the pupil can be well dilated, the most desirable procedure is the simple extraction advocated by Otto Barkan, or some modification thereof. If it is difficult to dilate the pupil before operation, however, a linear extraction with full iridectomy is indicated. This applies particularly to the rubella cataract. Injection of air into the anterior chamber at the conclusion of the operation is a very important factor in preventing anterior peripheral synechiae. In the simple linear extraction it prevents the formation of anterior synechiae between the iris and the incision.

While linear extraction is the operation of choice, it cannot be used in all cases. Careful study of each case, in the light of a thorough knowledge of the nature of congenital cataracts, will in some instances indicate that other procedures are advisable.

The importance of the use of atropine or scopolamine after any type of congenital cataract surgery, for as long as 2 months after the eye seems to have cleared entirely, cannot be overemphasized. If mydriatics are discontinued before all the cortex is absorbed, there is usually an occlusion of the pupil or posterior-synechia formation. (A. M. A. Arch. Ophth., August 1951, F. C. Cordes)

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Topical Use of Chloramphenicol in External Ocular Infections

Although penicillin, aureomycin and various sulfonamides have greatly simplified the treatment of external ocular infections, the development of resistant organisms or strains of organisms and certain disadvantages inherent in various drugs now available make it desirable to find additional antibacterial and antiviral preparations which can be used locally in the eye. The usefulness of chloramphenicol in a wide range of bacterial, rickettsial and probable viral infections has suggested its use in topical therapy of external ocular infections. A 0.1 percent or 0.2 percent solution of chloramphenicol in physiologic saline proved quite satisfactory in this study. The chloramphenicol solutions have exhibited excellent stability and appear to retain their activity for at least 2 to 3 months. The "gelsiccated" preparation to form 0.5 percent solution, supplied by the manufacturer, is reported to have a similar period of stability; and the 1 percent ointment in a "jelene" base, an indefinite period of stability.

Additional advantages, which became evident early in the course of this study, were freedom from toxic reactions and comfort in administration. There have been to date no toxic or allergic manifestations of any type from the use of the solution and only relatively mild irritative reactions to the ointment in 4 cases. A large proportion of patients have volunteered that the drops produce a definite soothing and comfortable sensation upon instillation.

Animal Experiments. To check tolerance, chloramphenicol was instilled topically into the eyes of 3 rabbits together with sodium sulfacetimide and aureomycin solutions. No reactions of any type were produced either by the chloramphenicol or the other 2 drugs.

In order to test the possible effectiveness of chloramphenicol against herpes simplex of the cornea, 18 rabbit corneas were inoculated by scratch from known herpetic lesions, and chloramphenicol solution (0.1 percent and 0.2 percent) was instilled. Comparisons were made with untreated eyes, eyes treated with sodium sulfacetimide solution and eyes treated with aureomycin solution. In this small series of rabbit eyes the results are inconclusive and demonstrate no great advantage of chloramphenicol over either sodium sulfacetimide or aureomycin in herpetic ulcers of the cornea. An inhibitory effect, but no marked antiviral action, is demonstrated if the chloramphenicol is used very early in the course of the disease.

The infection in one rabbit eye, initially left untreated, progressed from a dendritic keratitis to severe hypopyon ulcer. It cleared dramatically when chloramphenicol solution was used after the hypopyon ulcer was well established.

Clinical Trial. Because it was evident that the animals tolerated the drug exceedingly well and also that secondary infections cleared rapidly on chloramphenicol therapy, a clinical trial of the drug in various external ocular infections was begun. Preparations used included the 0.1 percent and 0.2 percent solutions in physiologic saline, which were prepared by the author, and the 0.5 percent "gelsiccated" solution and 1.0 percent ointment supplied by the manufacturer. Included in this report are 65 consecutive cases with sufficient follow-up to make them of value.

The initial cases had done poorly over a long period of time on various other forms of therapy or had shown repeated recurrences despite previous presumably acceptable treatment. The latter cases were external ocular infections encountered in the outpatient clinic.

All patients had cultures and smears of scrapings from the conjunctival epithelium and the lid margins or, in the case of corneal lesions, from the corneal lesions themselves. Cultures reported as showing no growth were, in many cases, considered suggestive of viral infections. However, no facilities for cultivation of viruses were available. In one instance specific inclusions were found. In cases in which only Staphylococcus albus or nonhemolytic Staphylococcus aureus were found, coagulase determinations were run.

The frequency of application of the chloramphenicol solutions and ointment was determined by the apparent severity of the infection. Results were then graded as good, fair or poor, according to the completeness and speed of response as compared to that expected from well-established therapeutic agents. In the 65 patients results were graded as "good" in 49, "fair" in 12 and "poor" in 4.

The response of several patients, who had done very poorly on other drugs, appears to indicate that chloramphenicol is a valuable addition to the drugs and antibiotics available for topical use in ocular infections. It is noteworthy that among the previously treated cases were 2 of recurrent herpetic corneal lesions. An acute dendritic ulcer was not encountered during this initial trial period.

In general, the results given by chloramphenicol in this series appear to be as satisfactory in as great a range of conditions as those obtained with any previously used drug or antibiotic. Although the results in several cases of hemolytic staphylococcal infections were not satisfactory, in other hemolytic staphylococcal cases, chloramphenicol proved effective after other drugs had done poorly. However, it is the author's impression that hemolytic staphylococcal infections respond somewhat more slowly to chloramphenicol than to 30 percent sodium sulfacetimide. (Am. J. Ophth., August 1951, W. Roberts)

Note: Since this paper was submitted, chloramphenicol has been used topically for treatment in more than 200 additional cases of external ocular infections. Results have been comparable to those reported in the preliminary study, and have led to increasing preference for this drug. The author comments that he is unable to appreciate any real advantage of the "gelsiccated" preparation over the simply prepared saline solutions of chloramphenicol.

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A Method for the Rapid Preparation of Histological Sections

The preparation of tissue specimens for paraffin embedding is a tedious and time-consuming process. The method described here considerably shortens the time required and reduces the number of operations. Particular economies in this respect have been achieved in the dehydrating step, which has been

reduced to a single, simple operation.

Thin pieces of fresh tissue about 4 mm. thick, are placed in a modified Bouin's fluid consisting of: 80 percent ethyl alcohol, 150 ml; 40 percent formalin, 60 ml; glacial acetic acid, 15 ml; and picric acid crystals, 1 Gm. A minimum of 35 to 45 minutes immersion is required to fix the tissues. No harm is done by permitting them to remain in the fixative overnight. Washing in water is not necessary. Zenker's fluid, Helley's fluid, etc., also may be used, provided that the proper prescribed procedure, including washing, is followed for each fixative.

After fixing in the modified Bouin's fluid, the tissues are cut into slices 1-2 mm. thick. This can be done with a razor blade or sharp-edged knife.

Dehydration is rapidly accomplished by placing 4 to 8 slices of the fixed tissue in an Allihn filter tube (porosity of disk "medium," height above disk about 110 mm., capacity about 45 ml). Excess fixative is removed by rinsing with 5 ml. acetone and decanting. The filter is then filled with pure acetone, which is allowed to run freely by gravity. When the tube is about half full it is refilled to the top with additional acetone. This process is repeated once again. By the end of an hour the filter will have emptied and the dehydration process will have been completed.

As soon as the last of the acetone has disappeared through the disk, the tissues are cleared with xylene. This may be carried out conviently by pouring xylene into the Allihn tube. When the tissues become translucent they are removed immediately, since too long an exposure to xylene will render them brittle. Kidney slices may become translucent in 15 minutes, whereas spleen slices may require 45 minutes.

The cleared slices are placed in small, labeled, galvanized screen baskets, 1 inch in diameter and 3 inches high. These are placed in 250 ml. beakers containing melted paraffin (Tissuemat, mp, 54°-56°C) and maintained in a vacuum oven at 58° C and 560 mm. Hg. pressure. A desiccator, in an ordinary thermostatically controlled oven, connected to a Cartesian manostat with a vacuum filter pump, provides a satisfactory vacuum oven. After 30 minutes in the vacuum oven, the tissues are placed in a fresh beaker of pure paraffin and kept at 58° C for 30 minutes.

After the infiltration is completed, the slices are embedded in paraffin in the usual manner. It has been found useful on occasion to embed many tissues in the same block, using a cardboard box as a mold. If the box is large (3" x 3" or larger), care must be taken to use flexible cardboard sides to permit the paraffin to contract on cooling without splitting the block.

In the method described, dehydration is first favored by the presence of 80 percent alcohol in the fixing solution. It is greatly intensified by the technic which makes use of the sintered glass filters. This procedure tends to promote a high concentration gradient between the water in the tissue and the acetone outside by constantly allowing the partly diluted acetone to escape through the bottom of the filter while simultaneously replacing it with fresh fluid from above.

The use of a partial vacuum helps to remove the xylene and thus to favor the infiltration by a paraffin that is comparatively pure. Too high a vacuum tends to separate and disrupt the tissues.

The method has been used routinely in the Wellcome Research Laboratories for more than a year. By its use, it is possible to start with fresh tissues in the morning and to complete the preparation of sections for microscopic study before the end of the working day. Good results have been obtained with such difficult preparations as those showing clearly the cilia of the respiratory epithelium or the ciliated brush borders of the proximal convoluted tubules of the kidney. (Science, 17 August 1951, J. A. Tornaben and E. J. de Beer)

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Clinical Investigations on the Treatment of Urinary Bilharziasis

The results in treatment of 25 individuals infected with Bilharzia haematobia with enteric-coated tablets of Miracil D (Nilodin) are presented. A total of 100 mg. per Kg. of the drug was given to each patient over a period of 5 days in twice daily doses of 10 Mg. per Kg. The urine of the patients was examined after exercise daily during and for 1 month following treatment and thereafter at weekly intervals for a further 2 months; 19 were considered to be definitely cured. One patient, originally very heavily infected, continued to pass ova in reduced numbers throughout the period of follow-up and was therefore considered a failure. The remaining 5 passed ova at irregular intervals during the earlier part of the follow-up period but eventually became free between the 36th and 57th day after treatment ceased. The cure-rate may therefore be taken to be 96 percent. Macroscopic hematuria disappeared early and no erythrocytes were observed in the urine after the 17th day following the termination of treatment. Unpleasant side-effects such as headache, anorexia, nausea, vomiting, abdominal pain and giddiness were encountered and persisted in many cases for some days after administration of the drug had ceased. Complaints were more frequent among the younger men.

These results are discussed and compared with those obtained by previous workers. It is concluded that Miracil D administered orally is an efficient drug for the cure of urinary bilharziasis, but that its unpopularity with patients militates against its widespread use in treatment campaigns. (J. Trop. Med., July 1951, J. M. Watson, G. Pringle & A. K. Jamil)

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Herpangina

For many summers, a disease entity characterized by fever, sore throat and vesicular or ulcerated lesions on the anterior tonsillar pillars or soft palate, and chiefly affecting children has been prevalent in the District of Columbia and its environs. The disease is highly contagious and usually runs a benign, self-limited course. During the summer of 1950 it became widely disseminated, assuming epidemic proportions during July and August. It is now apparent that this disease is herpangina, a specific entity described by Zahorsky in 1920.

The disease was investigated in one area during the early summer of 1950 by Dr. R. J. Huebner and associates from the National Institutes of Health, who were able to isolate viruses of Coxsackie Group A from both throat washings and stools. This constituted the first indication that a specific virus was a probable cause of the disease. A study was therefore undertaken by the authors at Children's Hospital, Washington, D. C., in 22 patients; viruses were recovered from 86 percent. These viruses were similar to those classified among Group A Coxsackie viruses; 4 immunologically distinct strains were demonstrated. Neutralizing antibodies against homologous strains of virus were present in all convalescent serums, and a rise in titer was demonstrated during illness in 70 percent of cases.

Except for the findings in the throat, the remainder of the physical examination was negative. In most cases, the patient did not appear acutely ill. After defervescence there were few complaints aside from an occasional, persistent throat soreness. No complications were observed during either the acute or the convalescent phase of the illness. (New Eng. J. Med., 23 August 1951, R. H. Parrott, S. Ross, F. G. Burke & E. C. Rice)

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Review of Physical Disability Dispositions, 1950

The permanent loss in naval manpower due to medical factors is measured by the number of deaths and medical disability separations from the service. The attrition statistics involved with separations for medical causes is a problem of vital concern due to their effect on operational estimates and physical standards for recruitment. Generally speaking, medical disability separations are of two types: (1) individuals separated as a result of a recommendation of a Board of Medical Survey; (2) individuals separated through the Physical Evaluation System.

This report describes the characteristics of the physical evaluation cases which were completed (i.e. received final action) by Secretary of the Navy during 1950. Physical disability retirements and separations from Military service are governed by the provisions of the Career Compensation Act of 1949. Basically, the disability retirement law provides a means of separation from active duty of individuals who become physically unable to perform useful service.

During 1950 final decisions were reached on 3,039 Physical Evaluation Board cases. More than one-half were transferred to the retired list, 31 percent on a permanent basis and 23 percent temporarily. Terminal actions resulting in severance (with compensation) and discharge (without compensation) were almost equal in number, together they accounted for 35 percent of the total number of cases completed. The remaining 11 percent of the actions signified return to duty, continued treatment, sick leave, etc.

In a discussion of disability separation it is important to look into the types of conditions mainly responsible for causing manpower loss. Three groups of ailments: (1) infective and parasitic diseases; (2) mental, psychoneurotic and personality disorders and (3) diseases of bones and organs of movement comprised over 1/2 of the total number of principal disabilities mentioned as a cause for disability disposition during 1950. These conditions were likewise indicated in 37 percent of the permanent retirements, 81 percent of the temporary retirements, 52 percent of the cases severed and in 42 percent of those discharged.

More individuals were released for mental disorders than for any other diagnostic group of conditions. This group alone accounted for 24 percent of all the disability separations resulting from Physical Evaluation Board actions. The degree of impairment to the efficient operation of the naval service assumes added significance when it is realized that, in addition to these separations for mental conditions, there were many more who were discharged administratively for reasons relating to mental disorders.

It was observed that among the various methods of separation for physical disabilities, wide variations existed in the leading diagnostic conditions which were the causes for invaliding. For example, for those transferred to the permanent retired list diseases of the circulatory system exceeded all other diagnostic categories, while for those retired on a temporary basis the infective and parasitic conditions were most frequently mentioned. Tuberculosis was recorded as a primary ailment in 37 percent of the cases involving individuals placed on the temporary disability retired list. Among those released (severed and discharged) the mental conditions outranked all other ailments.

A disability evaluation was established in 2,178 cases involving invaliding from the service as a result of Physical Evaluation Board actions. A disability rating is determined according to the Veterans' Administration Rating Schedule in those cases indicating transfer to the retired list or severance with compensation. A disability rating is not established for those cases terminating in medical discharge without compensation. One-fourth of the individuals whose physical impairment was evaluated were rated as having 100 percent disabilities. An interesting fact is that approximately 60 percent of these men were placed on the temporary retired list. Tuberculosis was indicated in a majority of these cases. In contrast with this situation, 7 out of 10 of those with disabilities rated as 40 to 90 percent were permanently retired. About 46 percent of all those separated from the Navy and Marine Corps through the physical evaluation system were considered to have 30 percent or less of physical or mental impairment. This group included 572 individuals who were separated with a disability

evaluation of less than 30 percent. In these latter cases, 9 out of 10 were detached from the service with severance pay. (Statistics of Navy Med., August 1951)

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The Uncommon Metals

Research is rapidly increasing in the field of unusual metals. There are several reasons. As the demands for extraordinary properties in metals increase with the ever-growing complexity of modern technology, there is a tendency to look beyond the dozen or so tried and true common metals into the properties and alloying possibilities of the lesser known. Also, the constant search for materials to replace or supplement scarce metals encourages more attention to this newer field. It is not a small field by any means. Over 80 percent of the known 98 elements are metals, although some are unstable, or of doubtful value as metals at present. Even discounting these, and the common metals, the remainder constitute a vast storehouse of potential metal properties from which to draw as research makes them available.

Perhaps of greatest current interest is the activity in making metals of increasingly higher purity. Frequently this results in the discovery of unsuspected properties, particularly improved ductility, which permits a metal to be formed and used on its own merits instead of being a parasite coating or alloying addition to a stronger ductile base metal. The most dramatic example probably is titanium. On finding a workable method for obtaining sufficient purity to give high ductility, the way was opened to discovery of alloys having an unusual combination of high strength, comparatively low weight and corrosion resistance. These, with the potential abundance of the element, make titanium the most promising recruit to our list of structural metals. Zirconium is going through a similar transition, whereby its excellent corrosion resistance can be utilized in fabricated equipment. Hafnium recently has been prepared in a massive ductile form, and its properties will be explored. Pure thorium shows remarkable softness when prepared in a solid compact form.

Chromium, which has been common only as a bright, hard plating, has always been considered to be extremely brittle and unworkable. By proper purification it can now be made hot-workable, and individual grams show remarkably good cold ductility on working slowly. Likewise, vanadium shows promise of being a useful, fabricable metal. Hot-forming of pure beryllium is making this metal useful for purposes other than for alloying.

Practically unknown as a metal because of unworkable brittleness, bismuth now can be made into extremely soft ductile wire by proper processing. Such wire makes available to the physicist and electrical engineer some interesting properties - such as changing electrical resistance with change in magnetic field strength and a rather high thermoelectric power. Also dear to the heart of the physicist is the growing development in availability and purity of some of the semiconductors, such as germanium, selenium, tellurium and silicon, which make available diode rectifiers and transistors, among many growing applications.

Research among these metals and others near the borderline between metals and nonmetals promises to furnish the key that will open the way to realization of that very worth-while dream -- the practical, direct conversion of heat to electrical energy.

The protection of metals against corrosion and high-temperature oxidation by cladding or coating is becoming more important with growth of various types of jet engines and other equipment exposed to extreme temperatures. Typical of one type of solution has been the formation of a silicon-base coating on molybdenum, which in experimental work permits the molybdenum to be heated in air at 1,500° to over 2,000 °C.

Rare metals which soon may not be so rare that they cannot be considered for special uses include high-melting rhenium and low-melting gallium. Like so many of the unusual metals, and the group as a whole, their importance is not so much what they can do now but how little we know about them. Thus they constitute a fruitful field of metallurgical research, of which recent developments are only an indication of what lies ahead. (Science, 3 August 1951, B. W. Gonser)

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Training Course for Inactive Volunteer Naval Reserve Medical and Dental Officers in Amphibious Medicine

A training course of 2 weeks' duration for Naval Reserve medical and dental officers in Amphibious Medicine is to be conducted at the Amphibious Training Command, U. S. Naval Amphibious Base, Little Creek, Virginia. It is scheduled to convene on Monday, 1 October 1951 and continue to 13 October 1951.

The purpose of this course is to familiarize inactive Volunteer Naval Reserve Medical Department officers in amphibious operations in general, and the medical aspects thereof in particular. The course consists of lectures, training films, demonstrations and practical exercises to familiarize Medical Department officers with the nature of the medical service provided in amphibious operations. The embarkation, underway and debarkation phases of the medical service are dealt with, and medical supply problems are presented.

Officers concerned should provide themselves with fatigue or utility-type uniform equipment for participation in the practical aspects of this course. Meals and sleeping quarters will be available at the Bachelor Officers' Quarters for those officers who desire such accommodations.

The 1st, 3d, 4th, 5th, 6th, 8th, 9th Naval Districts, and the Potomac River Naval Command have been assigned quotas for this course.

Inactive Reserve Medical Department officers are encouraged to take advantage of the opportunity to attend this course on active training duty orders in a pay status. All inactive Volunteer Reserve Medical Department officers who desire to attend this course should submit their request to the Commandant of their home naval district at the earliest practicable date.

(Reserve Div., BuMed)

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From the Note Book

1. The second annual Medico-Military Symposium for all members of the Armed Forces Medical Services will be held at the U. S. Naval Hospital, Philadelphia, Pa., from 22 to 27 October 1951, inclusive.

2. A special report of the Committee on Medicolegal Problems dealing with malpractice claims appears in the J. A. M. A. (page 54) of 1 September 1951. The report contains many suggestions as to what can be done to reduce the incidence of unjust suits. This report should be read by all medical and dental personnel.

3. Accumulated data indicate that glycerol monoacetate, commercial "Monoacetin", is a practical antagonist to fluoroacetate poisoning regardless of the species-specific pattern which poisoning follows. (J. Pharmacol. & Exper. Therap., May 1951, M. B. Chenoweth, A. Kandel, L. B. Johnson & D. R. Bennett)

4. A national survey to determine the prevalence of congenital malformations among the children of physicians, laboratory aides and others who are constantly exposed to radiation through their work in x-ray or radium therapy will be made with the aid of a Public Health Service grant. The outcome of the study, under the direction of Dr. S. H. Macht of the Washington County Hospital, Hagerstown, Md., may throw some light on radiation effects which may result from atomic warfare and may reveal whether current protective measures for personnel in radiological laboratories are really safe. (News release, FSA, PHS, NIH, 7 September 1951)

5. A colloquium on the chemotherapy of tuberculosis was held at Dublin, Eire, 10-13 July 1951. The papers and discussion covered such topics as the tubercle bacillus, chemotherapy of tuberculosis, anti-tubercular agents, use of thiosemicarbazones, and chemotherapeutic agents in urogenital tuberculosis. Leading research workers from Europe, United States, Africa, the British Isles and the Orient were present. (Summarized by Office of Naval Research, London, August 1951)

6. Dr. H. Pierre Klotz, of the Hopital Bichat, Paris, reports the treatment of exophthalmos by (1) x-irradiation of the pituitary gland; (2) a new drug named phrenatol (para-hydroxy-propiophenone); (3) an estrogen (hexoestriol). According to Dr. Klotz, treatment with estrogen is the one of choice and may be combined with x-irradiation of the pituitary. (European Scientific Notes, ONR, London, 1 August 1951)

7. An experimental study and evaluation of certain antihistamines for use in auricular fibrillation appears in the Journal of Pharmacology and Experimental Therapeutics, August 1951. (E. L. McCawley, G. A. Weston & N. A. David)

8. A description of a method of mounting gross biologic material in plastic boxes appears in Science, 31 August 1951. (T. W. Farmer, L. M. Pence & M. Moeller)

9. A contract, sponsored by the Psychophysiology Branch, Bio Sciences Group, to study taste as a guide to the selection of foods which the body needs, is only one part of the Naval research underway on the senses of man as they relate to his performance in situations important to the Navy. (Bio Sciences Group, ONR, September 1951.)

10. The superficial scarification of the scapular region is advocated in order to obtain a thin smear of dermal juice, which stained with Giemsa, provides an easy and more accurate means, both quantitatively and qualitatively, of diagnosing malaria parasites as well as microfilarias of both blood and skin. (Am. J. Trop. Med., July 1951, L. Van Den Berghe, M. Chardome)

11. The social responsibility of the physician to his colleagues, his patients and the public is discussed in New England Journal of Medicine, 16 August 1951, by J. H. Townsend.

12. The largest single prism in the world is destined to cover the 33 inch eye of the ADH Baker-Schmidt telescope at the Harvard College Observatory's Boyden Station at Bloemfontein, South Africa. (Science News Letter, 18 August 1951)

13. A survey of the health and sanitation programs of 17 Central and South American countries is being undertaken by the Public Health Service for the Institute of Inter-American Affairs. The major purpose of the survey, headed by Dr. W. L. Halverson of California, is to appraise the influence of the IIAA's 9 year health and sanitation program on the development of local health organizations, the rate at which the programs and methods are being incorporated into the permanent health structure and the extent to which the health habits of the people are being influenced. (News Release, FSA, PHS, 22 August 1951)

14. Cancer of the skin is 95 percent curable, when it is diagnosed and treated properly in its early stages, according to Cancer of the Skin, a pamphlet recently published by the Cancer Institute of the NIH. (Outside the Ivory Tower, Am. J. Surg., September 1951)

15. Neomycin is proposed as an efficient antibacterial agent acting locally in the gastrointestinal tract following oral administration. Combined neomycin-sulfathalidine therapy is advocated for preoperative preparation of patients being subjected to colon surgery. (Texas Rep. Biol. & Med., Vol. 9, No. 3, Fall 1951, E. J. Poth, R. G. Martin, S. M. Fromm, R. I. Wise & Chin Min Hsiang)

16. With the support of a P. H. S. grant, 4 or more generations of 1 family, numbering approximately 1,200 persons, will be studied in order to determine whether and how heredity influences the development of arthritis and rheumatism.

The studies will be under the direction of Dr. M. Whittinghill of the University of North Carolina. (News release, FSA, PHS, NIH, 30 August 1951)

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Chest Disease Essay Award

The Board of Regents of the American College of Chest Physicians offers a cash prize award of $250.00 to be given annually for the best original contribution, preferably by a young investigator, on any phase relating to chest disease. Manuscripts must be submitted not later than 1 April 1952. For further information, consult the executive office, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

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List of Recent Reports Issued by Naval Medical Research Activities

Medical Research Laboratory, U. S. Naval Submarine Base, New London, Conn.

The Parameters of Scotopic Sensitivity: (1) The Effect of Size, NM 003 041.09.03, 20 June 1951.

Evaluation of Beckman Model "C" Gas Analyzer, NM 002 015.03.03, 10 August 1951.

Naval Medical Field Research Laboratory, Camp Lejeune, North Carolina

A Study of the Effects of Procaine Penicillin G in Gelled Oil Following Intravenous Administration, NM 005 052.22, June 1951.

Protective and Armored Garments With Related Pertinent Mechanisms of Wounding, NM 006 013.01.04, July 1951

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The Commanding Officer, U. S. Naval Hospital, Philadelphia, recommends that stool examinations, particularly for ova of Ascaris lumbricoides, be performed on all service personnel returning from the Korean area.

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BUMED CIRCULAR LETTER 51-120 27 August 1951

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations

Subj: Submission of Claims on NavMed-U (Report of Medical, Dental and Hospital Treatment of the Personnel of the Navy and Marine Corps by other than the Medical Department of the Navy).

Ref: (a) BuMed Cir Ltr 50-97; NDB Jul-Dec 1950, 50-670, p 131
(b) Chapter 20, Manual Medical Department

1. Reference (a) was issued in an attempt to reduce the number of claims on subject form which have to be returned by the Bureau to the preparing activity for completion or elimination of inconsistencies. In general, the results have been gratifying. However, there are still many instances in which it is evident that a more careful perusal of the NavMed-U and accompanying bills would have resulted in submission of properly prepared claims -- thus eliminating the need for further correspondence. Renewed attention should be given to preparing subject claims with all possible care and discretion, following closely the requirements of pertinent instructions (references (a) and (b)).

2. Experience has shown that many bills for medical services from civilian sources are received direct from the payees, and, in the great majority of the cases, there is no NavMed-U on file. This necessitates action by the Bureau to obtain a report and other required papers, thereby causing a further delay in effecting settlement of the claims. It is believed that the major reason for non-submission of such NavMed-U reports is the failure of naval personnel returning from leave to report their illness or injury. Every possible means should be utilized to overcome this omission and to ensure that all cases are promptly reported.

3. Prompt submission of bills is essential in order that the Bureau may reserve sufficient funds for payment of those expenses found properly chargeable to the Medical Department. To ensure prompt submission, in all cases where naval personnel receive medical services from civilian sources, and bills have not been forwarded to the activity preparing the NavMed-U reports, the activity should ascertain whether bills will be forthcoming. Such bills should be secured and forwarded with the NavMed-U reports to the Bureau. In contacting the individuals, firms or institutions rendering services, care should be exercised that no statements or commitments are made as to the liability of the Navy Department.

H. L. Pugh

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BUMED CIRCULAR LETTER 51-121 29 August 1951

From: Chief, Bureau of Medicine and Surgery
To: Commanding Officers, Naval Hospitals, Continental

Subj: Tuberculin testing of Medical Department personnel assigned to hospitals for duty on the staff

Ref: (a) BuMed Circular Letter No. 51-27 of 8 Feb 1951
(b) BuMed Circular Letter No. 51-101 of 28 Jun 1951

Encl: (1) NavMed-1336(8-51) Individual Report of Conversion of Tuberculin Test
(2) NavMed-1337(8-51) Annual Report of First Tuberculin Test After Entering Naval Service
(3) NavMed-1338(8-51) Annual Tuberculin Retesting Report

This Circular Letter, which will not be printed in the Navy Department Bulletin, contains instructions for the initiating and reporting of tuberculin testing of Medical Department personnel assigned to hospitals for duty on the staff. The program is effective 1 November 1951 and all Medical and Dental personnel under the age of 35 reporting to a Naval hospital for staff duty, whose records contain no report of a prior positive reaction since entering the Naval service, shall receive the test. An annual test and special retest are provided for. Instructions for obtaining the tuberculin, syringes, needles, technic and the reading of the test are contained in this letter as well as in Circular Letter 51-27 of 8 February 1951 and 51-101 of 28 June 1951. Report forms are being printed and will be available from the District publications and printing offices.

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BUMED CIRCULAR LETTER 51-122 7 September 1951

From: Chief, Bureau of Medicine and Surgery
To: All Medical Department Activities and Facilities

Subj: Publication of professional papers; expenses in connection with

Ref: (a) BuMed Cir Ltr No. 50-94 of 29 Aug 1950

1. Reference (a) is hereby amended to include other professional papers in addition to those directly related to research.

2. The provisions of reference (a) pertaining to the publication and the purchase of reprints of research reports are to be adhered to in connection with other professional papers.

3. Requests for authority to incur expenses in connection with the above should be held to a reasonable minimum.

C. J. Brown
Acting

The above letter will not be printed in the Navy Department Bulletin.

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BUMED CIRCULAR LETTER 51-123 7 September 1951

From: Chief, Bureau of Medicine and Surgery
To: BUMED Management Control Activities; District, River Command, and Fleet and Force Medical and Dental Officers

Subj: Preparation and posting of safety precautions

Ref: (a) Art. 0406, U. S. Navy Regulations
(b) Art. 0712, U. S. Navy Regulations
(c) OPNAV INSTRUCTION 510.1

1. References (a), (b), and (c) assigned and outlined the areas of responsibilities and duties of Naval Technical Assistants and Commanding Officers in regard to the preparation and posting of safety precautions.

2. The Naval Technical Assistants are in the process of determining what safety precautions need to be posted with general guides as to their location.

3. The Bureau of Medicine and Surgery will prepare and issue in manual form the safety precautions necessary for the administration of matters under its technical control. In addition, directives will be promulgated for the distribution of forms and cards or placards suitable for posting. These directives will describe suitable posting locations.

4. Eventually the Safety Precautions Board and the various technical assistants will publish manuals on safety precautions for their special fields. Posters and materials also will be provided.

5. Until such time as the above mentioned materials become available, the provisions of paragraphs 3b(3), 4, and 5 of reference (c) must be carefully observed.

C. J. Brown
Acting

The above letter will not be printed in the Navy Department Bulletin.

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Active Duty Applications Desired

A limited number of vacancies now exist in the Medical Corps of the Navy and applications for active duty are desired from Reserve medical officers who are not above the rank of Lieutenant Commander, and the age of 45 years.

Applications should be submitted to the Chief of Naval Personnel via the Commandant of the Naval District in which the officer's records are maintained and the Bureau of Medicine and Surgery (Code 3423). Applications are especially desired from those medical officers who participated in the Navy V-12 Training Program while a student in medical school and who have not completed a total of 24 months' active service as a medical officer, exclusive of any naval internship in which he may have participated.

Applicants are advised to designate 3 choices for initial duty assignment in their application and every effort will be made to assign the officer to the duty station of his choice.

Attention is invited to the provisions of Public Law 351 of the 80th Congress which authorizes the payment of $100.00 additional remuneration to all medical officers on active duty, with the exception of naval interns.

(Personnel Div., BuMed)

NAVY DEPARTMENT
BUREAU OF MEDICINE AND SURGERY
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OFFICIAL BUSINESS

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NavMed-369 - 9/51

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